Energy, Mines and Resources Canada

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Canada Centre for Mineral and Energy Technology

Centre canadien de la technologie des minéraux et de l'énergie

Coal Research Laboratories

Laboratoires de recherche sur le charbon

Canada

ANNUAL REPORT OF THE COAL RESEARCH LABORATORIES: 1990/1991

Compiled by V. Marshman and C. Spitieris

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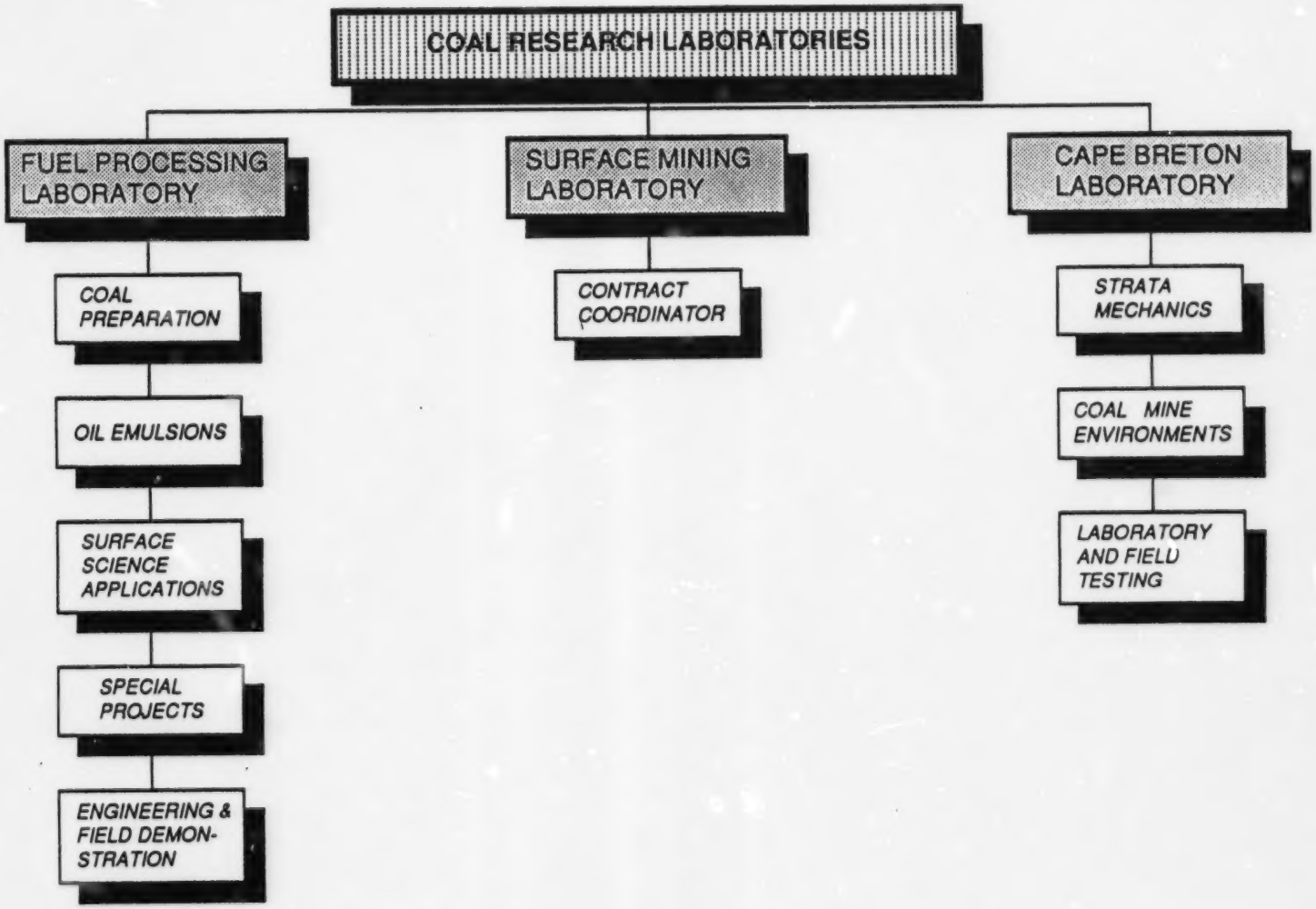
THE ORGANIZATION OF THE COAL RESEARCH LABORATORIES


COAL RESEARCH LABORATORIES
FUEL PROCESSING LABORATORY
COAL PREPARATION
OIL EMULSIONS
SURFACE SCIENCE APPLICATIONS
SPECIAL PROJECTS
ENGINEERING & FIELD DEMON-STRATION
SURFACE MINING LABORATORY
CONTRACT COORDINATOR
CAPE BRETON LABORATORY
STRATA MECHANICS
COAL MINE ENVIRONMENTS
LABORATORY AND FIELD TESTING

RESOURCES

The 1990/91 activities of Coal Research Laboratories were carried out under both the Fuels Technology and Coal Mining and Preparation sub-activities of the Mineral and Earth Sciences Program. The resources allocated to the division were distributed as shown below:

	Staff Level (PY)	Budget Operating $000's	Budget Capital $000's
Bitumen/Emulsion Treatment	11	340	240
Coal Preparation	20	869	260
Coal Desulphurization	--	80	50
Coal Reserve Assessment	1	40	--
Coal Mining: East	14	300	130
Coal Mining: West	4	150	30
Management & Support	11	290	5
	61	2,069	715

These resources were distributed across three operating laboratories and a divisional administration group:

Devon	:	Fuel Processing
Devon	:	Surface Mining (Coal Mining West)
Cape Breton	:	Underground Mining (Coal Mining East)
Devon	:	Administration

PROFESSIONAL, TECHNICAL AND SUPPORT STAFF 1990/91

Name	Degrees and Diplomas	
DIRECTOR'S OFFICE		
T.D. Brown	B.Sc. (Durham), Ph.D. (Sheffield) C. Eng.	Director
V. Marshman		Secretary
FINANCE, PERSONNEL AND ADMINISTRATIVE SERVICES		
C.F. Cameron		Admin. Officer
J. Young		Secretary
S. Iwaskow (Devon)		Clerk
F. Willette (Devon)		Clerk
B. Hommy (Devon)		Clerk
W. Abtosway (Devon) (Parttime)		Clerk
J.I. MacDonald (Sydney)	B.B.A. (St. Francis Xavier)	Clerk
COAL MINING RESEARCH LABORATORIES (Sydney & Devon)		
D.B. Stewart	B.Sc., M.Sc., P.Eng. (Queens)	Manager

CAPE BRETON Sydney, Nova Scotia

D. Forrester	B.Sc., Ph.D., P. Eng.	Group Leader
C. Spitieris		Secretary
B. Bresson		Clerk/Typist
G.A. Haslett	B.Sc. (Durham), C.Eng., P. Eng	SAPP

Strata Mechanics

D. Payne	B.Eng. (TUNS), P.Eng. (TUNS)	Engineer

Coal Mine Environments

G.W. Klinowski	M.Sc. (Silesia Tech.)	Engineer
B.W. Konda	B.Eng. (Hyderabad) Ph.D. (Nottingham) *(On assignment to RPO Ottawa)*	Phys. Scientist
J.C. Hwang	B.Sc. (Taiwan);M.Sc. (Central) M.Sc. (McGill);Ph.D. (McGill)	Research Scientist
D.J. Kennedy	B.Sc. (Windsor)	Phys. Scientist

Laboratory and Field Testing

G.W. Bonnell	B.Sc. (Dalhousie)	Chemist

C. MacNeil		CS
W.E. Gallant		EG
D. Chipman		EG
D.A. Young	B.Sc. (UCCB)	Phys. Scientist
G.R. Corbett	B.Sc. (UCCB)	Phys. Scientist
L.S. O'Leary		EG

SURFACE MINING LABORATORY Devon, Alberta

A. Stokes	B.Sc., Ph.D. (Nottingham)	Research Scientist

Employees Declared Surplus

R.K. Singhal	B.Sc. (Nottingham), Ph.D. (Newcastle-on-Tyne) C.Eng., P.Eng. *(On secondment to Revenue Canada)*	Phys. Scientist
H.G. Naidu	B.Sc., A.I.S.M. *(On secondment to Consumer & Corporate Affairs)*	Engineer
G.H. Larocque	(On secondment to Revenue Canada)	EG
B. Das	B.Sc., A.I.S.M. Ph.D. (Ostrava), P.Eng. *(On secondment to Western Economic Diversification)*	Research Scientist

FUEL PROCESSING LABORATORIES Devon, Alberta

H.A. Hamza	B.Sc. (Cairo), Ph.D., (Newcastle-on-Tyne)	Manager
D. Caron		Secretary
L. Kerr		Secretary
R. Germain	B.Sc. (Waterloo), M.Sc. (Waterloo)	Phys. Scientist

Oil Emulsions

R. Mikula	B.Sc. (Saskatchewan) Ph.D. (British Columbia)	Research Scientist
C. Payette	M.Sc. (McGill)	Phys. Scientist
V. Munoz	B.Sc. (University of Chile)	Phys. Scientist
W. Lam	B.Sc. (Western Ontario) Ph.D. (Alberta)	Research Scientist
C. MacConnachie	B.Sc.H. (Queen's), Ph.D. (Queen's)	Research Scientist
K. Kar		EG

Engineering and Field Demonstration

K. Hashmi	B.Sc. (Alberta), P.Eng.	Engineer
M. Hewlett		EG

Surface Science Applications

J.C. Donini	B.Sc. (Western Australia), Ph.D. (York)	Research Scientist
K. Michaelian	B.Sc. (California), Ph. D. (Simon Fraser)	Research Scientist
K. Kasperski	B.Sc. (Lethbridge), M.Sc. (McGill);Ph.D. (Alberta)	Research Scientist
C. Preston	B.Sc. (Queen's);M.Sc., Ph.D. (Toronto)	Research Scientist
C. Angle	B.Sc. (Alberta),;M.Sc. (Alberta)	Phys. Scientist
W.F. Mo	B.Sc. (Alberta)	Phys. Scientist

Special Projects

N.E. Andersen	B.Sc. (Alberta)	Phys. Scientist
G. Leopold	B. Eng.(McGill) M.B.A.(Calgary)	Engineer
R. Zrobok	B.Sc. (Alberta)	Phys. Scientist
K. McAuley		EG

Coal Preparation

M.W. Mikhail	B.Sc. (Assuit), M.Sc. (Alberta) P.Eng	Engineer
A.I. Salama	B.Sc. (Alexandria), Ph.D. (Alberta)	Research Scientist
W.I. Friesen	B.Sc. (Brock) Ph.D. (British Columbia	Research Scientist
A.B. Fung	B.Sc. (Waterloo), P.Eng.	Engineer
O.Humeniuk		EG

STAFF CHANGES

New Employees

R. Germain
L. Kerr
D. Payne
Y. Attia (Executive Interchange)
T. Hassan (PDF)
E. Hileman (Executive Interchange)
T. Ityokumbul (PDF)
C. MacConnachie
D. Sengupta (PDF)
S. Thind
D. Woo

Resignations and Separations

A. Romaniuk
N. Matthews
R. Kolada
O. Ogunsola (PDF)
H. Sieben
I. Parsons
G. Bilecki
B. Herath (PDF)
V. Srajer

PUBLICATIONS, PRESENTATIONS AND PATENTS

BOOKS

Mikula, R.J., "Characterization of Emulsions", Advances 231, Edited by L. Schramm. American Chemical Society.

Leopold, G., "Breaking Produced Fluids and Process Stream Emulsions", Advances 231, Edited by L. Schramm. American Chemical Society.

JOURNAL PUBLICATIONS

Angle, C.W., Zrobok, R. and Hamza, H.A., "Surface Properties, Reactivity, Electrokinetics and Interactions of Oilsands Sludge Clays", Inst. of Canadian Petroleum Technology, CIM/AOSTRA 91-125, Vol. 3, March, 1991.

Donini, J.C., Angle, C.W., Kasperski, K.L., Preston, C.K., Kar, K., Hassan, T.A., and Thind, S.S., "Electrocoagulation", Instrument Society of America 1991 Symposium Proceedings, May, 1991, Edmonton, Canada.

Donini, J.C., Latimer, R.C., Kasperski, K., and Angle, C.W., "Electrocoagulation: Some Basic and Operating Characteristics", Proceedings of the 11th International Coal Preparation Congress 1990, Tokyo, Japan, October 22-26, 1990.

Friesen, W.I. and Michaelian, K.H., "Deconvolution and Curve-Fitting in the Analysis of Complex Spectra. The CH Stretching Region in Infrared Spectra of Coal", Applied Spectroscopy 45, 50-56; 1991.

Forrester, D.J., "CANMET an Underground Coal Mining Research in Canada"; For publication in MINTECH 91; April 1991.

Goulin, C.A. and Baird, M.C., "Disproportionation Reactions of the Dimeric Allyilron Compound [h^3-$C_3H_5Fe(CO)_3$]2; Formation of Novel Cationic h3-Allylironticarbonyl Complexes" Inorganic Chemica Acta; 168, 195-197; 1990.

Goulin, C.A., Huber, T.A., and Baird, M.C., "Atom Transfer Reactions Involving the Metal Centered Radical {$CpCr(CO)_3$} "Chemical Communications; 1991.

Michaelian, K.H., "Step-Scan Photoacoustic Infrared Spectra of Kaolinite", Infrared Physics 30, 181-186; 1990.

Michaelian, K.H., "Data Treatment in Photoacoustic FT-IR Spectroscopy", Vibrational Spectra and Structure, J.R. Durig, ed., (Elsevier, Amsterdam), Vol. 18; 1990.

Hocking, M.B., Syme, D.T., Axelson, D.E. and Michaelian, K.H., "Water Soluble Imide-Amide Copolymers. I. Preparation and Characterization of Poly(acrylamide-co-sodium N-(4-sulfophenyl)maleimide)", Journal of Polymer Science, Part A: Polymer Chemistry 28, 2949; 1990.

Hocking, M.B., Syme, D.T., Axelson, D.E. and Michaelian, K.H., "Water Soluble Imide-Amide Copolymers. I. Preparation and Characterization of Poly(acrylamide-co-sodium N-(4-sulfophenyl)maleimide)", Journal of Polymer Science, Part A: Polymer Chemistry 28, 2949; 1990.

Hocking, M.B., Syme, D.T., Axelson, D.E. and Michaelian, K.H., "Water Soluble Imide-Amide Copolymers. II. Preparation and Characterization of Poly(acrylamide-co-p-maleimidobenzoic acid). Journal of Polymer Science, Part A: Polymer Chemistry 28, 2969; 1990.

Hocking, M.B., Syme, D.T., Axelson, D.E. and Michaelian, K.H., "Water Soluble Imide-Amide Copolymers. III. Preparation and Characterization of Poly(acrylamide-co-N,N-diallylaniline) and Poly(acrylamide-co-sodium N,N-diallylsulfanilate)", Journal of Poylmer Science, Part A: Polymer Chemistry 28, 2983; 1990.

Michaelian, K.H. and Friesen, W.I., "Photoacoustic FT-IR Spectra of Separated Western Canadian Coal Macerals. Analysis of the CH Stretching Region by Curve-Fitting and Deconvolution", Fuel 69, 1271-1275; 1990.

Michaelian, K.H., S. Yariv, and A. Nasser, "The Study of the Interactions between Caesium-Bromide and Kaolinite by Photoacustic and Diffuse Reflectance Infrared Spectroscopy", Canadian Journal of Chemistry 69, 749-754; 1991.

Michaelian, K.H., "Depth Profiling of Oxidized Coal by Step-Scan Photoacoustic FT-IR Spectroscopy", Applied Spectroscopy 45, 302-304; 1991.

Mikhail, M.W. and Osborne, D.G., "Magnetite Heavy Media: Standards and Testing Procedures", Coal Preparation, Vol. 8, pp. 111-121; 1990.

Payette, C. and Martin, R.F., "Melt Inclusions in the Quartz Phenocrysts of Rhyolites from Topaz and Keg Mountains, Thomas Range, Utah", Ore-Bearing Grantite Systems; Petrogenesis and Mineralizing Processes. Stein, H.. and Hannah, J.L. ed; Geological Society of America Special paper 246, p. 89-102; 1990.

Scoular, R. J., Kurucz, L., Verkoczy, B., Mikula R.J., MacConnachie, C.A., Payette, C., and Munoz, V.A., "Emulsions Research - Final Technical Report for April 1, 1990 - March 31, 1991"; Saskatchewan Research Council, p. 110-186 C-91; March 1991.

Suggett J. C., Collins P. M. C. and Stokes A. W.; "In Situ Monitoring at Aostra's Underground Test Facility", The second China-Canada Heavy Oil Technical Symposium, Proc.; Beijing, People's Republic of China; Oct 29-Nov. 1 1990.

Horsfield D. W.' Stacey P. F. and Stokes A. W.; "Spoil Pile Stability in Canadian Prairie Open-Pit Coal Mines"' Proceedings of the Mine Planning and Equipment Selection Conference, Calgary, Alberta, Oct. 1990

Zrobok, R. and Angle, C.W., "A Preliminary Investigation of the Rhelogical Properties of Oilsand Tailings Sludge", Inst. of Canadian Petroleum Technology, CIM/AOSTRA 91-129, Vol. 3; March, 1991.

CONFERENCE PROCEEDINGS AND PRESENTATIONS

Angle, C.W., Smith-Palmer, T., Wenzell, V., and Hamza, H.A. "Effects of Adsorption of Cationic Polymers on Flocculation of Coal Thickener Feed in Washery Water", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July, 1990.

Angle, C.W. and Hamza, H.A., "Titration Experiments of a Relatively Unoxidized Coal", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July 15-18, 1990.

Donini, J.C., Roberge, R., and Preston, C.K., "Design of BOMEM FTNIR Spectrometer For Process Control and Initial Testing", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July 15-18, 1990.

Donini, J.C., Angle, C.W., Kasperski, K.L., Kelebek, S., Preston, C. K., Kar, K., Hassan, T.A., and Thind, S.S., "Electrocoagulation", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July 15-18, 1990.

Donini, J.C., Angle, C.W., Kasperski, K.L., Kelebek, S., Preston, C. K., Kar, K., Hassan, T.A., and Thind, S.S., "Electrocoagulation", Instrument Society of America 1991 Symposium Proceedings, May, 1991, Edmonton, Canada.

Donini, J.C., Angle, C.W., Kasperski, K.L., Kelebek, S., Preston, C.K., Kar, K., Hassan, T.A., and Thind, S.S., "Electrocoagulation", Proceedings of the World Environmental Conference, March 1991, Calgary, Canada.

Donini, J.C. and Preston, C.K., "Some Experience with In-Line NIR Process Control", Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) XVII Proceedings, October 6-11, 1991, Anaheim, CA.

Forrester, D.J., Gallant, W.D. and Forgeron, S., "Cable Slings as Remedial Gateroad Support on Phalen 2 West Panel; Presentation to Nova Scotia Mining Society; Sydney, Nova Scotia; October 27, 1990.

Friesen, W.I. and Levine, S., "The Interaction Energy Between Two Charged Water Droplets in an Oil Medium in an Electric Field", 40th Canadian Chemical Engineering Conference, Halifax, July 15-18, 1990.

Friesen, W.I. and Ogunsola, O.I., "Mercury Porosimetry and Principal Component Analysis of Upgraded Low-Rank Coals", 40th Canadian Chemical Engineering Conference, Halifax, Nova Scotia, July 15-18, 1990.

Gallant, W.D., "Evaluation of Weed Packwall Supports"; CIMM, Annual General Meeting in Ottawa; May 1990.

Goulin, C.A. and Baird, M.C., "Reactions of Organic Radicals Induced by the Organometallic Radical {$CpCr(CO)_3$} ", 73rd Canadian Chemical Conference, Halifax, Nova Scotia, July 15-18, 1990.

Kasperski, K.L. and Ogunsola, O.I., "Thermal Analysis of Nigerian Coals Using Thermogravimetry", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July 15-18, 1990.

Klinowski, W.G. and Kennedy, D.J., "Tracer Gas Techniques Used in Mine Ventilation", Proceedings of the 5th U.S. Mine Ventilation Symposium; Morgantown, W.V.;June 3-5, 1991.

Leopold, G. and Sieben, H.F., "Pilot-Scaled Plants for Heavy Oil Emulsion Treatment", presented at the CIC/CCh.E Conference, Halifax, Nova Scotia, July 15-18, 1990.

Michaelian, K. H., "Step-Scan Photoacoustic FT-IR Spectroscopy", Spectroscopy Society of Canada, 36th Conference, August 1-3, 1990, St. Catherines, Canada.

Mikhail, M.W., and Gillies, R., "Coal-Water Mixture from Upgraded Lignite for Pipeline Transportation", IEA Meeting on Coal-Water Mixtures, Vancouver, April, 1990.

Sahay, H. and Mikhail, M.W., "Potential of Dense Coal Applications for Alberta Coals", IEA Meeting on Coal-Water Mixtures, Vancouver, April, 1990.

Mikula, R.J., Payette, C., Lam, W.W., and Munoz, V., "Microscopic Observation of Structure in Oil Sands Sludge", paper CIM/AOSTRA 91-120; presented at Petroleum Society of CIM and AOSTRA 1991 Technical Conference, Banff, April 21-24, 1991.

Mikula, R.J., Lam, W.W., and Munoz, V.A., "Characterization of Emulsions and Emulsion Interfaces", 40th Canadian Chemical Engineering Conference, Halifax, Nova Scotia, July, 1990.

Mikula, R.J., Payette, C., Lam, W.W., and Munoz, V.A., "Correlated Optical and Electron Microscopy for Characterization of Coke and Catalyst," Electron Microscopy Society of America Annual Meeting, San Jose, CA, August 4-9, 1991.

Mikula, R. J., Munoz, V.A., and Lam, W.W., "Applications of Microscopy in the Oil Industry", Microscopical Society of Canada, Annual Meeting, Calgary, June, 1991.

Munoz, V.A., Mikula, R.J., and Lam, W.W., "Correlation of Optical and Electron Microscopy for the Characterization of Carbonaceuous Solids", 40th Canadian Chemical Engineering Conference, Halifax, Nova Scotia, July, 1990.

Munoz, V.A., Lam, W.W., and Mikula, R.J., "Unique Microscopic Techniques for the Study of Catalyst Deactivation and Coke Deposition", Canadian Society for Chemical Engineering, Annual Meeting, Vancouver, October, 1991.

Lott, R.K., Cyr, T., Munoz, V.A., and Oballa, M.C., "Control of Coke Formation in Heavy Oil Processing", World Petroleum Congress, Buenos Aires, Argentina, October, 1991.

Munoz, V.A., Mikula, R.J., and Lam, W.W., "OM/SEM Correlations during Investigations of Coke Formation and Catalysts Deactivation", presented at the Colloid and Surface Science Lectures and Workshops, Kananaskis, April, 1990.

Payette, C., Lam, W.W., Angle, C.W., and Mikula, R.J., "Evaluation of Improved Lime Neutralization Processes. Part 2 - Sludge Characterization"; presented at the 2nd International Conference for the Abatement of Acid Mine Drainage; Montreal, Sept. 16-18, 1991.

Preston, C.K., "Applications of FTNIR Spectroscopy", Colloid and Surface Science Lectures and Workshops (sponsored by CANMET, Syncrude Canada Inc. and AOSTRA), May, 1990.

Preston, C.K. and Donini, J.C., "Operating Characteristics of CANMET's BOMEM FTNIR Spectrometer", Instrument Society of America 1991 Symposium Proceedings, May, 1991, Edmonton, Canada.

Salama, A.I.A., Mikhail, M.W., and Humeniuk, O.E., "The Role of a Pilot Scale Facility in Performing R&D and Helping Canadian Coal and Mineral Industry" 92nd CIM Annual General Meeting, Ottawa, May, 1990.

Salama, A.I.A., "Density-Size Separation Characteristics Estimation Based on Mass Distributions", Abstracts Proceedings of the 40th Canadian Chemical Engineering Conference, Halifax, Nova Scotia, July 15-21, 1990.

Hyma, D.B. and Salama, A.I.A., "Design and Implementation of a Process Control System for Column Flotation", The 29th Annual Conference of Metallurgists, CIM, Hamilton, Ontario, August 26-30, 1990.

Salama, A.I.A., "Coal Research Laboratories - Coal Preparation Computer Applications R&D", proceedings of the SecCon 90, IEEE Northern Canada Section, Edmonton, Alberta, September 29, 1990.

Salama, A.I.A., Mikhail, M.W., and Humeniuk, O.E., "The Role of a Pilot Scale Facility in Coal Preparation R&D and Helping Canadian Coal Industry", Proceedings of the 11th International Coal Preparation Congress, October 22-23, 1990, Tokyo, Japan.

Salama, A.I.A. and Friesen, W.I., "Mineral Processing Separation Modelling Using Neural Networks", accepted for presentation at the IASTED International Symposium on Modelling and Simulation, Calgary, July 16-18, 1991.

Salama, A.I.A., Mikhail, M.W., Parsons, I.S., and Friesen, W.I., "Coal Research Laboratories Coal Preparation Computer Software Package", accepted for presentation to the 2nd Canadian Conference on Computer Applications in the Mineral Industry Sept 15-18, 1991, Vancouver.

DIVISIONAL REPORTS

UNCLASSIFIED

CRL 88-16 (OP,TR)	Validation of a Truck/Shovel Simulation Model	V. Srajer R.J. Kolada N.J. Stuart J.K. Szymanski
CRL 88-17 (OP,TR)	Optimization for Maximum Production of Truck/Shovel Mining Systems	V. Srajer R.J. Kolada N.J. Stuart J.K. Szymanski
CRL 88-18 (OP,TR)	Operations Research for Western Canadian Coal Mines	V. Srajer R.J. Kolada N.J. Stuart J.K. Szymanski
CRL 88-19 (OP,J)	Development of an Automated ΔP Instrument and its Application to Mining Handling and Preparation Problems	M.W. Mikhail R.J. Mikula
CRL 88-20 (INT)	Visit Report - Attendance at the Second Meeting of the Technical Committee on Support Systems Under the USBM/OMOL/CANMET Cooperative Agreement on Rock Mechanics and Ground Control and a Tour of the Homestake Mine, Lead, South Dakota; November 17-19, 1987	W.D. Gallant
CRL 88-23 (OP,J)	Coal Dustiness: Characterization and Control	R.J. Mikula I.S. Parsons
CRL 88-24 (OP,TR)	Selection, Loading and Hauling Equipment: User Practices	V. Srajer N.J. Stuart R.J. Kolada J.K. Szymanski
CRL 88-25 (INT)	Cape Breton Coal Research Laboratory Annual Report FY 87-88	T.R.C. Aston G.W. Bonnell G.A. Haslett B.W. Konda
CRL 88-26 (TR)	Data Compilation Report: Strata Deformation Monitoring, No. 3 TBM Tunnel, Donkin-Morien Mine, N.S.	T.R.C. Aston D. Chipman W.D. Gallant

CRL 88-28 (J,OP)	Correlations Between Oil Sands Minerals and Processing Characteristics	R.J. Mikula V.A. Munoz W.W. Lam
CRL 88-29 (OP,J)	Study of the Dynamic Stability of Mine Waste Dumps	B. Stuckert J. Balfour D. Fawcett P. Sheehan B. Das
CRL 88-30 (OP,TR)	Review of Coal Mine Waste Rock Dump Stability in British Columbia	A. Kent B. Das
CRL 88-31 (INT)	Proposed CBCRL/CBDC Research Program to Investigate the Use of Water by Shearers for Reduction of Respirable Dust	C.Y. Hwang W. LeBlanc G.W. Bonnell
CRL 88-32 (INT)	Proposed CBCRL/CBDC Research Program to Study Methane Make and its Leakage Pattern from a Sealed Longwall Panel in an Underground Coal Mine	B.W. Konda D.J. Kennedy A. Harvey B. MacNeil D. Petrie
CRL 88-33 (TR)	Interfacial Thermo Dynamics and Adsorption 1. An Introduction to Surface Energetics and a Survey of Temperature Dependence Studies	C.W. Angle
CRL 88-34 (TR)	The Application of Rock Bolt Design Methods to a Proposed 7 West Crosscut, Prince Mine, Sydney Coalifield, N.S.	T.R.C. Aston W.D. Gallant
CRL 88-35 (TR,OP,J)	A Simulation Analysis Model for Continuous Surface Miner and Trucks Operation Using Slam II	W.H. Griffin J.K. Szymanski
CRL 88-36 (TR)	Statistical Analysis of Collected Times Between Failure and Times to Repair of Easi-Miner at Obed Mine	J.K. Szymanski C. Williams
CRL 88-37 (OP)	Developments in Mine Monitoring - A Western Canadian Perspective	N.J. Stuart A. Makosinski R.J. Kolada J.K. Szymanski V. Srajer

CRL 88-38 (OP)	Blast Casting: Field Trials and Evaluation in Canadian Surface Coal Mines	H.G. Naidu
CRL 88-39 (TR)	Solvent Effects on Acid Base Equilibria	C.W. Angle
CRL 88-40 (TR)	Coal Research Laboratories Annual Progress Report 1987-1988	Compiled by J.C. Donini B.W. Konda D.B. Stewart
CRL 88-41 (TR)	Preliminary PH Analysis of Coal Slurries from the Sydney Coalfield, N.S.	M.J. Campbell G.R. Corbett T.R.C. Aston
CRL 88-43 (OP,J)	Numerical Modelling of Tunnel Steel Supports	F.P. Hassani H.S. Mitri T.R.C. Aston
CRL 88-44 (INT)	Considerations in the Support of Gateroads for Longwall Retreat Mining	G.A. Haslett
CRL 88-45 (TR)	Proposal for the Development of a Computerized Guidance System for the Easi-Miner Continuous Mining Machine	A.B. Kempe V. Srajer
CRL 88-47 (INT)	Minexpo '88 Chicago, Illinois (Visit Report)	H.G. Naidu
CRL 88-48 (TR)	Survey of Microprocessor Based Performance Monitoring Devices in Canadian Surface Coal and Oilsands Mines in 1987	H.G. Naidu
CRL 88-49 (J,TR)	The Selection, Development and Testing of an Integrated Truck/Shovel Management System	V. Srajer L. Hick W. Sadler
CRL 88-50 (TR)	New Loader and Truck Payload Measurement Systems	V. Srajer
CRL 88-51 (TR)	Application of Truck Dispatching at Iron Mines in Labrador	V. Srajer
CRL 88-52 (OP,J)	Study of Attenuation of Blasting Vibrations in Coal Mine Waste Dump Materials	B.M. Das B. Stuckert J. Balfour P. Sheehan

CRL 88-53 (J)	The Influence of Particle Size on the Performance of γ-Ray Density	N.A. Mansour
CRL 88-54 (OP,J)	Interpretation of Thermograms to Determine Spontaneous Combustion Susceptibility of Coals	N.A. Mansour R. Chakravorty D.B. Stewart K. Kar
CRL 88-55 (TR)	Measurements of Solids Concentration in Coal Slurries Using Microwaves	N.A. Mansour
CRL 88-56 (OP, J)	A Knowledge Based Approach to Truck Dispatching	N.J. Stuart R.J. Kolada V. Srajer J. Szymanski
CRL 88-57 (IR)	Technical Note on the Construction of Stoppings or Dams in the Sydney Coalfield	G.A. Haslett
CRL 88-58 (J)	The Application of Strata Reinforcement Techniques for the Determination of In Situ Stress Conditions in Weak Coal Measures Strata	T.R.C. Aston E. Harvey C. Mirza
CRL 88-59 (OP,J)	Performance of Respirable Dust Sampling Systems in Underground Coal Mines	C.Y. Hwang G.W. Bonnell G.R. Corbett D.A. Young C.H. MacNeil
CRL 88-60 (TR)	Predicted Seafloor Subsidence Profile Data Using Both a "Normal and Modified" NCB Subsidence Engineers Handbook Method for the Phalen Mine, Sydney Coalfield, N.S.	T.R.C. Aston
CRl 88-63 (INT)	ASTM Committee D-5 On Coal and Coke: May 1988 Meeting	G.W. Bonnell
CRL 88-64 (TR)	Equipment Monitoring at Smoky River Coal Mine: Trip Report	V. Srajer
CRL 88-65 (OP)	Categorization of Western Canadian Coals with Respect to their Susceptibility to Spontaneous Combustion	R.Chakravorty K. Kar N. Mansour

CRL 88-66 (OP,J)	An Overview of the Research on Rock and Gas Outbursts in the Sydney Coalfield, Nova Scotia	C.M.K. Yuen P. Cain G.R. LeBel D.B. Stewart
CRL 88-67 (INT)	Visit Report on Visits Made to Pittsburgh, U.S.A. to Attend the 3rd Longwall U.S.A. Conference and Exhibition, September 13 - 15 and to visit USBM Bruceton, U.S.A., September 16	G.A. Haslett
CRL 88-68 (TR)	A Synopsis of Current and Planned Coal Transportation Initiatives	D.B. Stewart G. Zahary
CRL 88-69 (J)	Longwall Seafloor Subsidence Monitoring: How and Why	T.R.C. Aston
CRL 88-70 (TR)	A Cerchar Abrasivity Test Program Methodology Developed for the Sydney Coalfield, N.S.	G.R. Corbett T.R.C. Aston
CRL 88-71 (OP,J)	Mine Planning to Control Hazards From Spontaneous Combustion	R. Chakravorty
CRL 88-72 (TR)	Mine Roadway Surveys - Recommendations for an Optimum Survey Interval	T.R.C. Aston
CRL 88-73 (OP)	Respirable Dust Measurements in Underground Coal Mines	C.Y. Hwang
CRL 88-74 (TR)	A Cerchar Hardness Test Program Methodology Developed for the Sydney Coalfield, N.S.	M.L. Musial G.R. Corbett T.R.C. Aston
CRL 88-76 (TR)	Visit to the Central Mining Research Station Dhanbad, India	R. Chakravorty
CRL 89-1 (OP,J)	Pre-Mining Seafloor Topography Determination Over the Phalen Mine Workings, Sydney Coalfield, N.S.	T.R.C. Aston W.D Gallant A. Lapierre J.McG. Stewart
CRL 89-2 (TR)	Preliminary Cerchar Abrasivity Data, Sydney Coalfield, N.S.	M.L. Musial G.R. Corbett T.R.C. Aston

CRL 89-3 (TR)	Data Compilation Report: Roadway Height Measurements, 9 and 10 East Panels, Lingan Mine, Sydney Coalfield, N.S.	G.R. Corbett D.A. Young T.R.C. Aston
CRL 89-4 (TR)	Data Compilation Report: Roadway Height Measurements, 6 and 7 West Panels, Lingan Mine, Sydney Coalfield, N.S.	D.A. Young G.R. Corbett T.R.C. Aston
CRL 89-6 (TR)	The Semi-Dispatching System at the Lac d'Amiante Mine: Trip Report	V. Srajer
CRL 89-7 (TR)	Software for Digitizing Spontaneous Combustion Curves	N.A. Mansour
CRL 89-8 (OP,J)	Replacing Off-Highway Trucks	R.K. Singhal
CRL 89-9 (OP,J)	Tracer Gas Based Evaluation of the Auxiliary Ventilation System	G.W. Klinowski D.J. Kennedy
CRL 89-10 (TR)	Computer Aided Data Acquisition and Analysis for a Mercury Porosimeter	I.S. Parsons R.J. Mikula V.A. Munoz
CRL 89-11 (TR)	A Simulation Analysis Model for Dragline Operation Using SLAM II	J.K. Szymanski W.M. Borysuk
CRL 89-12 (TR)	Statistical Analysis Model of Collected Dragline Time Cycle Data	J.K. Szymanski W.M. Borysuk C. Williams
CRL 89-13 (TR)	Electrocoagulation in Water Media	J.C. Donini
CRL 89-14 (OP,J)	The Analysis of Mine Haulage Economics Using Direct Rolling Resistance Measurements	R.J. Kolada
CRL 89-15 (TR)	An Implementation of the Two Dimensional Lerchs - Grossman Algorithm	N.J. Stuart
CRL 90-4 (INT)	Water Pressure/Flow Measurements on CBDC Longwalls	J.C. Hwang
CRL 90-5 (IR)	An Investigation Into the Dust Settling/Impaction Rates in CBDC's Underground Coal Mines	G.W. Bonnell

CRL 90-6 (INT)	Cape Breton Coal Research Laboratory Annual Progress Report: FY 1990	G.A. Haslett
CRL 90-7 (J,OP)	Development and Validation of a Computer Based Simulation Model of a Bucket Wheel - Conveyor-Bin System	V. Srajer M. Wise
CRL 90-8 (OP)	Productivity Gains Through Advanced Technology	R.K. Singhal D.B. Stewart
CRL 90-20 (TR)	Annual Report of the Coal Research Laboratories: 1989/1990	Compiled by: V. Marshman C. Spitieris
CRL 90-22 (OP)	Cable Slings as Remedial Gateroad Support on Phalen 2 West Panel	D.J. Forrester W.D. Gallant S. Forgeron
CRL 90-23 (J)	CANMET and Underground Coal Mining Research in Canada	D.J. Forrester
CRL 90-24 (TR)	Optimization of Fine Coal Dewatering Circuit (Disc Filters) Victoria Junction Preparation Plant (Data Report)	D.A. Young G.R. Corbett K.A. Hashmi

CONFIDENTIAL

CRL 88-15 (CF)	Characterization of Tar Sands Bitumen	R.J. Mikula V.A. Munoz Z.M. Potoczny D.E. Axelson N.E. Andersen
CRL 88-21 (CF)	Dewatering of Sludge Produced from the Pretreatment of Produced Water at Murphy Oil's Lindbergh In Situ Heavy Oil Production Site Progress Report No. 2	K.A. Hashmi G.P. Zuber
CRL 88-27 (CF)	An Evaluation of the Dust Producing Activities of Monolithic Packing Procedures	G.R. Corbett
CRL 88-46 (CF)	Microscopic Study of Liquifaction Residues: Part I	V.A. Munoz

CRL 88-61 (CF)	Pictou County Coal Project: Technical Review Committee on Subsidence Evaluation - Discussion Document, August 1988	T.R.G. Aston
CRL 88-75 (CF)	A Preliminary Review of Equipment Maintenance Organization and Practices in Six Participating Canadian Surface Coal and Oil Sands Mines	H.G. Naidu
CRL 89-5 (CF)	Methane/Dust Surveys Conducted at Phalen 1 East Wall During the Period June 28-30, 1988	B.W. Konda G.W. Bonnell W.G. Klinowski J.C. Hwang
CRL 90-16 (CF)	Microscopic Evaluation Cold Lake Core Samples	R.J. Mikula W.W. Lam
CRL 90-19 (CF)	Primary Separation Vessel Control; Application of Image Analysis	R.J. Mikula W.I. Friesen V.A. Munoz

REPRESENTATION ON TECHNICAL COMMITTEES

INTERNATIONAL

American Society for Testing and Materials	
Committee D-5 on Coal and Coke (member)	G.W. Bonnell
CANMET/USBM "Memorandum of Understanding"	
Management Committee (member)	T.D. Brown
Support Systems Subcommittee (member)	W.D. Gallant
Agreement on Coal Slurry Pipelines (Federal Republic of Germany)	
Coordinator	T. D. Brown
Project Leader	M.W. Mikhail
International Association of Water Pollution Research and Control	
Special Group on Wastewater Reclamation and Re-use (member)	K.A. Hashmi
International Coal Preparation Congress Organizing Committee	
Canadian Representative	M.W. Mikhail
Control System Society - IEEE	
Control Systems Microprocessor-Based Control and Industrial System Groups (member)	A.I.A. Salama
International Conference of Safety in Mines Research Institute	
Canadian Representative	D.B. Stewart

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Program and Priorities Committee (member)..... D.J. Forrester

Computer Applications and Process Control Committee - CIM
Member..... A.I.A. Salama

INTERNATIONAL PUBLICATIONS

Coal Preparation Journal
Editorial Board..... M.W. Mikhail

RESEARCH CONTRACTS

CAPE BRETON COAL RESEARCH LABORATORY

TITLE	INVESTIGATOR	SCIENTIFIC AUTHORITY	STATUS MARCH 31/90
Drilling Services for Geotechnical Monitoring of Borehole from Lingan #1 Slopeover Phalen 2 West Wall Stop-Line	Logan Drilling Ltd.	W.D. Gallant	Completed
In Situ Stress Determinations at the Phalen Mine, Sydney Coalfield, Nova Scotia	Golder Associates	W.D. Gallant	Completed
Instrumentation of Split Set Slings at the Phalen Mine, Sydney Coal Field, Nova Scotia	Supportex Inc.	W.E. Gallant	Completed
Carbon Monoxide as Indicator of Early Detection of Spontaneous Heating in Stored Coal	Berkowitz Consulting Inc.	A. Stokes	Completed
Study for Developing Design Guidelines for Rock Anchoring of Bedded Footwall Slopes with Particular Reference to Coal Mines	Esso Resources Canada Limited	B. Das	Completed
Development of an In-Mine Borehole Logging System	Nova Scotia Research Foundation Corp.	D.J. Kennedy	Completed
Testing and Modification of WT-4000 Scale for Hydraulic Shovels	Kes Resources Enterprises Ltd.	V. Srajer	Completed
Design and Field Testing of a Programmable Logic Based System for an Electric Cable Shovel	Bullmoose Operating	R. Singhal	Completed

TITLE	INVESTIGATOR	SCIENTIFIC AUTHORITY	STATUS MARCH 31/90
The Hydrological Study of a Large Coal Stockpile	Nolan Davies and Associates, Sydney, N.S.	G. Bonnell	Completed
Optimization of Dragline Performance Through Computer Control (CANMET/Industry Co-operative Project)	N.B. Coal Ltd.	V. Srajer	Completed

FUEL PROCESSING LABORATORY

TITLE	INVESTIGATOR	SCIENTIFIC AUTHORITY	STATUS MARCH 31/90
Coal Processing Development Program 1990 Extension	Alberta Research Council	T.D. Brown	Continuing
Consulting Services for EMR to Play a Leading Role in the Establishment of the National Coal Research Centre (NCRC) in Devon	B.M.C - Supply & Services CDA	T.D. Brown	Continuing
Development of a Magnetic Circular Dichroism System for Emulsions	Carleton University	J. Donini	Completed
Degradation of Sludges From Heavy Crudes in Contained Reactors	Nova-Husky Res. Corporation Ltd.	J. Donini	Continuing
Pilot Scale Electrocoagulation System	To Tender	J. Donini	Continuing

TITLE	INVESTIGATOR	SCIENTIFIC AUTHORITY	STATUS MARCH 31/90
Coal Analysis	Loring Laboratories Ltd.	O. Humeniuk	Continuing
Heavy Oil - Bitumen/Water Emulsion Analysis	Core Laboratories - Canada Ltd.	G. Leopold	Continuing
Long Term Implications of Alternative Methods of Fine Coal Tailings Disposal	Nolan, Davis & Associates Ltd.	M. Mikhail	Continuing
Development of a Sampling Technique for Airborne Coal Dust and Analytical Method for Coal in a Particulate Matrix	B.C. Research	R. Mikula	Continuing
Design and Implementation of Process Control System for A Column Flotation	Hatch Associates Ltd.	A. Salama	Continuing
A Research Proposal to Study Rheology and Flow in Porous Media of Water-in-Oil Emulsions	Petro Canada Resources	R. Zrobok	Continuing
A Research Proposal to Study Rheology and Flow in Porous Media of Water-in-Heavy Oil Emulsions	Petroleum Recovery Institute	R. Zrobok	Continuing

COST RECOVERY AND COLLABORATIVE RESEARCH

JOB #	JOB TITLE	ORGANIZATION
00021	Optimization of Fine Coal Dewatering/Circuit (Disc Filters) at CBDC	Cape Breton Development Corporation
00050	Secondment of C. Payette	University of Saskatchewan
00051	Design of Point Aconi Themal Generating Station Cooling Intake Tunnel	Associated Mining Conusltants
00052	Exploratory and Non-Routine Sample Studies	Syncrude Canada
00053	Exploratory Work on the Feasibility H_2 and S from H_2S	University of Alberta
00054	CBDC-CBCRL Cooperative Research and Development Program Plan	Cape Breton Development Corporation
00055	Thermal Analysis of Submitted Samples	Sherrit Gordon Ltd.
00056	Study on Developing a Practical Simulation Model for the Compound Water Cyclone	Cyclone Engineering Sales
00057	Methane Gas Content Determinations of Borehole Coal Samples	Pan Canadian Petroleum Ltd.
00058	Characterization of Bitumen Separation and Coalescence in Pipelining	Esso Resources Canada
00059	Develop NIR Technology to Measure Bitumen Content of Bitumen/Water/Solid Slurry	Esso Resources Canada
00060	Perform a Dewatering Test in the Clean Coal Centrifuge	Alberta Research Council
00061	Wetting Agents For Use on Conveyor Belts	Suncor Inc.
00062	Oil Sludge Study	AOSTRA Sludge Consortium

00063	Determining Typical Methane and Dust Levels in the Coal Receiving Bunker	Nova Scotia Power Corp.
00064	Evaluate a Magnetite Deposit by Characterizing its Properties	St. Paul Minerals Ltd.
00065	Microscopic Evaluation of Pyrite in Coal	Adam Consulting Engineers
00066	Use of Pilot Plant Equipment to Perform Dewatering and Crushing Runs	Alberta Research Council
00067	Chemical and Physical Changes Which Occur During Drying of OBED Coal	OBED Coal
00068	Tracer Gas Ventilation Study	INCO Ltd. - Manitoba Division
00069	Analysis of Samples of Dultion Steam Water for Hydrocarbons	Alberta Gas Ethylene Co. Ltd.
00070	Perform a Pilot Plant Test using the Batac Jig on Reject Material	Alberta Research Council
00071	Research and Consulting Related to Emulsion Research	Saskatchewan Research Laboratories
00072	Establish Means to Maximie Recovery of Thermal Coal from Coal Refuse	Fording Coal
00073	Feed Coal Sample Analysis, Thermal Treatment, Product Coal & Analysis of Results	TransAlta Utilities
00074	Development of Mobile Thickening and Dewatering Plant	Les Industries Fournier Inc.
00075	Extensive Sampling Program	Quintette Coal Ltd.
00076	Test Biological Activities by Means of Calorimetry	Nova Husky Research Corp.
00077	TRS Freeze Project	Syncrude Canada Inc.

00078	Exploratory Work on the Feasibility H_2 and S from H_2S	University of Alberta
00079	Pilot Scale Electrocoagulation	Luscar-Sterco (1977) Ltd.
00080	Scanning Electron Microscope Evaluation of Liberation Size, X-Ray Diffraction to Determining the Mineral Forming Titanium in the Raw Material	St. Paul Minerals Ltd.